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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/719,416	11/21/2003	Eric R. Wood	ASMEX.429A	3418

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EXAMINER

MOORE, KARLA A

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 12/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/719,416

Applicant(s)

WOOD, ERIC R.

Examiner

Karla Moore

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 15-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 28-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>0304</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-14 and 28-31, drawn to a reaction chamber, classified in class 118, subclass 715.
 - II. Claims 15-27, drawn to a method of forming a reaction chamber, classified in class 29.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the process as claimed can be used to make another and materially different product. For instance, the process as claimed can be used to make another and materially different product, such as one having a first opening and a second opening disposed on opposite ends of the reaction space.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Mr. Eli A. Loots on 11 March 2005 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-14 and 28-31. Affirmation of this election must be made by applicant in replying to this Office action. Claims 15-27 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 28-30 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,834,022 to Mahawili.

7. Mahawili discloses a reaction chamber in Figure 1, comprising: an upper wall (46), a lower wall (3) and a plurality of side walls (31 and 38) configured to process a semiconductor substrate at reduced pressures (column 6, rows 47-49); at least one of said upper and lower walls being formed of two flat, angled segments that have surfaces facing an interior of the chamber and that form an interior angle of less than 180 degrees (column 7, row 63 through column 8, row 18).

5. With respect to claim 29, the angled segments slope at an angle of less than about 10 degrees with respect to the horizontal (Figure 7c; column 7, row 63 through column 8, row 18).

6. With respect to claim 30, the angled segments slope at an angle of about 7 degrees with respect to the horizontal (Figure 7c; column 7, row 63 through column 8, row 18).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 3-5 and 8-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,695,567 to Kordina et al in view of U.S. Patent No. 4,630,669 to Kessler et al.

9. Kordina et al. disclose a reaction chamber, in Figures 4-6, substantially as claimed and comprising: a chamber upper wall (13) and a chamber lower wall (14) made of a material which is heat resistant and non-reactive with gases introduced into said chamber; wherein said chamber upper wall and said chamber lower wall each comprise two, flat rectangular segments that are slightly out of parallel with each other such that each of said chamber upper wall and chamber lower wall has a pitch, and said

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itches point away from each other (see the views of the reaction chamber shown in the cross-sectional view of Figure 4 and the end view of Figure 4).

10. Examiner notes that the presently claimed invention is an apparatus that could be used to practice numerous processing methods using numerous different processing gases at varying temperatures. Depending on the particular gases and temperatures used the material of the apparatus of Kordina et al. would be heat resistant and non-reactive. The courts have ruled that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987)

11. However, Kordina et al. fail to teach the reaction chamber comprising a transparent material.

12. Kessler et al. teach that is known in the semiconductor wafer processing industry to use transparent quartz material as a construction material for a reactor to be used at high temperature with a furnace for the purpose of forming thin layer of materials with desirable properties (column 1, row 22-35).

13. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a transparent quartz wall material in Kordina et al. in order to form a hot wall reactor for forming thin layers of materials with desirable properties as taught by Kessler et al.

14. With respect to claims 3-5, said pitch comprises a bend in each of said chamber upper wall and said chamber lower wall (see Figures 5 and 6 of Kordina et al.). Said also pitch comprises a joint between two rectangular segments (see Figures 5 and 6 of Kordina et al.). Kordina et al. and Kessler et al. fail to teach that the joint comprises a welded connection between the two rectangular segments. However, the courts have ruled that an express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. In re Fout, 675 F.2d 297, 213 USPQ 532 (CCPA 1982). One of ordinary skill in the art would recognize that the pitch could be formed by bending a single segment or by joining two separate segments at an angle using a welding.

15. With respect to claims 8-13, which are all drawn to sizing of the chamber that would vary depending on the size of the substrate to be processed, Examiner notes that the courts have ruled that expressions relating the apparatus to contents thereof during an intended operation are of no significance

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in determining patentability of the apparatus claim. Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969).

16. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kordina et al. and Kessler et al. as applied to claims 1, 3-5 and 8-13 above, and further in view of U.S. Patent No. 5,244,694 to Ozias.

17. Kordina et al. and Kessler et al. disclose the invention substantially as claimed and as described above.

18. However, Kordina et al. and Kessler et al. fail to teach the reaction chamber further comprising an inlet flange secured at a forward end of said chamber to said chamber upper and chamber lower walls, and an outlet flange secured at a rearward end of said chamber to said chamber upper and chamber lower walls.

19. Ozias teaches providing an inlet flange for the purpose of locating a combination gate and reactant gas inlet port adjacent the chamber and providing an outlet flange for the purpose of surrounding an outlet exhausting gases from within the reaction chamber (Figure 2, 77 and 73, respectively, column 4, rows 55-59).

20. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an inlet and outlet flange in Kordina et al. and Kessler et al. in order to locate a combination gate and reactant gas inlet port adjacent the chamber and in order to surround an outlet exhausting gases from within the reaction chamber as taught by Ozias.

21. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over over Kordina et al. and Kessler et al. as applied to claims 1, 3-5 and 8-13 above, and further in view of U.S. Patent No. 4,920,918 to Adams et al.

22. Kordina et al. and Kessler et al. disclose the invention substantially as claimed and as described above.

23. However, Kordina et al. and Kessler et al. fail to teach each of said chamber upper and lower walls has a thickness ranging between about 4 and about 6 millimeters or is about 5 millimeters.

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24. Adams et al. teach the use of reactor chamber walls of a thickness of 0.16 inch (4.064 millimeters) for the purpose of providing reactor chamber walls with a decreased amount of deposition on the inner wall of the reaction chamber and to combat breakage due to thermal expansion (column 5, rows 19-21 and 46-50).

25. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided walls with a thickness of about 5 millimeters in Kordina et al. and Kessler et al. in order to decrease the amount of deposition on the walls and in order to combat breakage due to thermal expansion as taught by Adams et al.

26. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kordina et al. and Kessler et al. as applied to claims 1, 3-5 and 8-13 above, and further in view of U.S. Patent No. 4,920,918 to Adams et al.

27. Kordina et al. and Kessler et al. disclose the invention substantially as claimed and as described above. The chamber further comprises a substrate support (Figure 2, 5) is provided within said chamber and at least one heat source (18) provided outside of said chamber, said heat source positioned around said chamber.

28. However, Kordina et al. and Kessler et al. fail to teach the substrate support rotating around a central axis.

29. Adams et al. teach rotating a wafer in a reactor system for the purpose of minimizing surface anomalies within the chamber (column 1, rows 41-43).

30. It would have been obvious to one of ordinary skill in the art to have provided a rotating substrate support in Kordina et al. and Kessler et al. in order to minimize surface anomalies within the chamber as taught by Adams.

31. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mahawili as applied to claims 28-30 above.

32. Mahawili discloses the invention substantially as claimed and as described above.

33. However, Mahawili fails to teach the exact dimensions of the chamber width and chamber height.

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34. Mahawili do however teach that for different sized wafers and depending on the processing parameters chamber dimensions will vary (column 6, rows 43-68). Thus the chamber dimensions would be directly related to the type of substrate to be processed and the processing parameters. The courts have ruled that expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim. Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969).

35. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have empirically determined chamber dimensions based on the size of a substrate to be processed and the processing parameters to be used as taught by Mahawili.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 571.272.1440. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571.272.1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Karla Moore
Patent Examiner
Art Unit 1763
9 December 2005